State of Hawaii DEPARTMENT OF LAND AND NATURAL RESOURCES Division of Forestry and Wildlife Honolulu, Hawaii 96813

May 13, 2010

Chairperson and Members Board of Land and Natural Resources State of Hawaii Honolulu, Hawaii

Aloha Land Board Members:

SUBJECT: PROGRESS BRIEFING TO THE BOARD OF LAND AND NATURAL

RESOURCES REGARDING HAWAII'S "STATEWIDE ASSESSMENT OF

FOREST CONDITIONS AND RESOURCE STRATEGY"

SUMMARY

It is my pleasure to brief the Board of Land and Natural Resources on our progress in completing Hawaii's "STATEWIDE ASSESSMENT OF FOREST CONDITIONS AND RESOURCE STRATEGY (SWARS)". These two documents will help DOFAW and our stakeholders assess the conditions of our forests, watersheds, native species, forest products industry and forest recreational opportunities and will outline our strategy to protect, manage and sustain these resources for current and future generations.

Today's briefing will summarize our process, what we identified as our critical issues, and how we are developing our Strategies to sustainably manage our natural resources.

The Hawaii SWARS is being produced by the Division of Forestry and Wildlife (DOFAW) to fulfill a mandate of the Redesign effort¹ of the State and Private Forestry (S&P) organization within the U.S. Forest Service in conjunction with a suite of new provisions added to the Forestry Title of the 2008 Farm Bill (P.L. 110-234). Hawaii SWARS meets the legal requirements set forth by the 2008 Farm Bill and it directly addresses the National Outcomes and Objectives of the S&P Redesign to 1) Conserve Working Landscapes, 2) Protect Forests From Harm and 3) Enhance Public Benefits Associated with Trees and Forests.

All US states, territories and the Pacific Island Freely Associated States are required to submit a first Assessment and Strategy to the US Secretary of Agriculture no later than June 18, 2010.

¹ The purpose of the State & Private Forestry Redesign is to create a new approach to State and Private Forestry in order to shape and influence forest land use on a scale, and in a way, that optimizes public benefits from trees and forests for both current and future generations.

	7.81		

We have used this process as an opportunity for DOFAW to promote new collaborative efforts among the many agencies, institutions and landowners actively involved in the stewardship of Hawaii's natural resources.

The basic requirements of this effort will be to:

- Identify and provide an analysis of present and future forest conditions, trends, and threats on all land ownerships.
- Identify any areas or regions of the state that are a priority.
- Identify any multi-state areas or issues that are a regional priority.
- Incorporate all approved Federal, State, Local and natural resource management plans.
- Develop long-term strategy to address threats to forest reserves and resources needed to implement the strategy.

This effort is unique in many ways, it involves all landownership - state, private and federal, and views forests and trees as a whole and not by programs. The states and territories were granted a great deal of flexibility in preparing their Assessment and Strategy documents to best meet the unique needs of each state. The Redesign Process and the 2008 Farm Bill did however, include a set of requirements that each state must fulfill.

As part of this process, that each state forestry agency had to coordinate with the State Forest Stewardship Coordinating Committee, the State Technical Advisory Committee of the Natural Resources Conservation Service, the State Urban Forestry Council, state wildlife agency and applicable federal land management agencies to ensure that their completed Assessment and Strategy addresses the rural-to-urban landscape continuum and identifies opportunities for program coordination and integration. The Farm Bill explicitly directed the states to integrate the Comprehensive Wildlife Conservation Strategy (CWCS), and the Statewide Comprehensive Outdoor Recreation Plan (SCORP), all Community Wildfire Protection Plans (CWPP's), and other relevant plans.

The Division has met these requirements in developing our Assessment and Strategy.

In a series of meetings with our stakeholders we identified 9 issues. For each issue we characterized the trends, the existing conditions, the threats and benefits of our forest landscapes. We created maps with the most current public information available, identified priority areas and developed a set of strategies for addressing the issues identified in partnership with our stakeholders.

The required deliverable products from this project are the Hawaii's Assessment of the condition of our Forests as they are in 2010, and our 5-10 year Strategy. A summary of the issues and strategy is attached for your information and any input. Once compiled, the document will be circulated to our Partners and posted on the DOFAW SWARS webpage for public information and input. The Hawaii SWARS will be completed and submitted to the Secretary of Agriculture by the June 18th deadline.

	**		

This process and the document we will produce is of value because it will enable the Division to seek and base funding on landscape scale management and not only on narrow program mandates. This initiative offers us an opportunity to plan, and integrate the many programs we work on together under one document. We have an opportunity to demonstrate the value of our forests and trees to the State and nation, and describe our strategy to work together to protect our forests from harm, and conserve forests in a working landscape. The information and data we produce will be of use to others in the future. Hopefully, this information will be useful to influence our communities, our State and national legislators, and our government leaders to invest in Hawaii's forests for the future.

The document we are preparing represents the beginning of a process, not the end, where we will continually update and inform our collective understanding of our forest assets and what is affecting them, and apply that knowledge to guide and improve our management. The initial assessment and strategy, will evolve over time and we will continue to seek input from our partners and communities to update and improve upon it.

Attachments

faul & conry

Respectfully Submitted,

PAUL J. CONRY, Administrator Division of Forestry and Wildlife

APPROVED FOR SUBMITTAL:

Laura H. Thielen, Chairperson

Issue 1: Water Quality and Quantity

the County Boards of Water Supply and the Watershed Partnerships groundwater recharge areas by maintaining a healthy forest. This document incorporates by reference all existing approved water Forestry and Wildlife was established to create and manage the Hawaii Forest Reserve System whose main function is to protect the management plans that have been developed by the Commission on Water Resource Management (CWRM), the Office of Planning, The importance of abundant, clean fresh water is the single most important resource for survival on a tropical island. The Division of

State Issue: Watershed Management: Controlling Feral Ungulates and Invasive Species

•		_	_	•			
				Tropical Botanical Garden, USFWS, NPS, USFS, NRCS, TNC, USGS, US Army, County water departments.			
	ungulates removed	,		Hawaii, Hawaii Counties, National	Council, USFS Forest Health.		
	 Mumber of feral 	Maui County	•	Affairs, University of	Invasive Species		approved methods.
	inspected and	US Fish and Wildlife	•	Hawaiian Homelands,	Wildlife and Forestry		trapping and other
	 Miles of fenceline 	other state funds.		landowners, Dept. of	System, DOFAW	Areas Statewide	and staff hunting,
	fenced	Fund (Conveyance Tax),	•	watershed partnership	Natural Area Reserves	Partnership	through fencing, public
	•		•				
				departments.			
				Army, County water			
		Maui County	•	TNC, USGS, US			
		Council	0	NPS, USFS, NRCS,			
		Hawaii Invasive Species	• =	Garden, USFWS,	Development Program.		
		Americorps Internships	•	Tropical Botanical	Technology		areas.
	updated	Development Program		Counties, National	Health and Special		watershed partnership
	completed or	Special Technology	·	Hawaii, Hawaii	Council, USFS Forest		management plans for
	management plans	Forest Health grants	•	Affairs, University of	Invasive Species		prioritized weed
	 Number of weed 	Service	S	Office of Hawaiian	Sections, Hawaii		and implementing
	threaten watersheds	US Fish and Wildlife	•	Hawaiian Homelands,	Wildlife and Forestry		weed surveys, creating
	species that	other state funds		landowners, Dept. of	System, DOFAW	Areas Statewide	species by carrying out
	treated for invasive	Fund (Conveyance Tax),	7	watershed partnership	Natural Area Reserves	Partnership	incipient invasive
	 Acres surveyed/ 	Natural Area Reserve •	•	Private and public	Watershed Partnerships,	Watershed	 Control established and
Objectives	1	Implement				Area(s)	
National	Success	Available/Required to		,	Contribute	Landscape	!
Supports	Measures of	Resources	97	Key Stakeholders	Program Areas that	Prionty	Long-term strategy

	 US Fish and Wildlife 			Aleas Statewide	Torests and eroued areas.
ټ 	Fund (Conveyance Tax		USFWS, USFS	Partnership	species in priority watershed
•	Natural Area Reserve	Same as above	Watershed Partnerships,	Watershed	6. Restoration of native
•					
		Ą			diseases, and inappropriate human use.
	 other state funds Forest Health 		Sections, Forest Health	Areas Statewide	additional key watershed threats such as fire
ن 	 Natural Area Reserve Fund (Conveyance Tax 	Same as above	DOFAW Fire, Forestry,	Watershed Partnership	5. Work closely with other programs to address
•	•				
• •					create sustainable funding, and develop new policies and laws.
<u>.</u>	other state funds		Watersned Farmersnips, The Nature Conservancy		watersned Parmersnips to share watershed management expertise,
	Natural Area Reserve	Same as above	Hawaii Association of	Statewide	4. Raise the capacity of
-			Education Association		
			Education, Hawaii Environmental		traditions.
	 Maui County 		Department of		unique cultural
•	Council		Council, State		science with Hawaii's
ń **	 Americorps Internships Hawaii Invasive Species 		Education, Hawaii		programs for children
	Service		Outreach, Conservation		education and volunteer
•	 US Fish and Wildlife 		Watershed Partnerships, DOFAW Education and		watershed management through outreach,
<u>پ</u> 	 Natural Area Keserve Fund (Conveyance Tax) 	Same as above.	Hawaii Association of	StateWide	involvement in
· · · · · · · · · · · · · · · · · · ·		Natural Area Reserve Fund (Conveyance Tax), other state funds US Fish and Wildlife Service Americorps Internships Hawaii Invasive Species Council Maui County Natural Area Reserve Fund (Conveyance Tax), other state funds Natural Area Reserve Fund (Conveyance Tax), other state funds Natural Area Reserve Fund (Conveyance Tax), other state funds Forest Health Natural Area Reserve Fund (Conveyance Tax), other state funds	Natural Area Reserve Fund (Conveyance Tax), other state funds US Fish and Wildlife Service Americorps Internships Hawaii Invasive Species Council Maui County Natural Area Reserve Fund (Conveyance Tax), other state funds Natural Area Reserve Fund (Conveyance Tax), other state funds Natural Area Reserve Fund (Conveyance Tax), other state funds Natural Area Reserve Fund (Conveyance Tax), other state funds Natural Area Reserve Fund (Conveyance Tax), other state funds	artnerships, same as above. ritnerships, cation of artnerships, cation and she cation of artnerships, sest Health ritnerships, cartnerships, same as above e., Forestry, sest Health same as above e. Partnerships, same as above e. Partnerships same as above e. Partnerships same as above e. Partnerships same as above	Watershed Partnerships, Hawaii Association of Watershed Partnerships, DOFAW Education and Outreach, Conservation Education, Hawaii Invasive Species Council, State Department of Education, Hawaii Education, Association Education Association of Watershed Partnerships, The Nature Conservancy Watershed Partnerships, Sewing Watershed Partnerships, Sections, Forest Health Watershed Partnerships, Same as above Natural Area Reserve Fund (Conveyance Tax), other state funds Natural Area Reserve Fund (Conveyance Tax), other state funds Natural Area Reserve Fund (Conveyance Tax), other state funds Natural Area Reserve Fund (Conveyance Tax), other state funds Natural Area Reserve Fund (Conveyance Tax), other state funds Natural Area Reserve Fund (Conveyance Tax), other state funds Natural Area Reserve Fund (Conveyance Tax), other state funds

			*	
	5			

Issue 2: Forest Health: Invasive Species, Insects and Disease

Hawaii Forest Health Strategies

Forest Health in Hawaii: Managing Invasive Species and Forest Pests

Although Hawaii is one of the most isolated island chains in the world, it is the center for travel and transport of goods to the Pacific and far west. As such, many invasive and non-native species have been introduced and the islands are regularly threatened by human induced introductions of non-native species. Management of invasive species in Hawaii involves working in diverse areas. Many species are initially detected in urban areas, around harbors and ports, along roadways, and in people's yards. If eradication is not initially possible they can quickly spread to adjacent forested watersheds. Much of Hawaii's low elevation forests, and where control of incipient populations frequently occurs, is predominantly made up of non-native species. Actions are taken to protect priority forest areas where native ecosystems remain largely intact, primarily at higher elevations. Maintenance of these priority forest areas requires ongoing monitoring and control of invasive species.

1.2 2.2 3.1 3.4 3.5	 Number of new tools developed Reduced price per acre protected 	Hawaii Invasive Species Council funds STDP Forest Service Research HDOA staff and facility UH scientists	University of Hawaii, USFWS, US Forest Service, USDA APHIS WS, USDA APHIS WS, USDA APHIS WS, NWRC, HDOA, UH, TNC, Hawaii Agriculture Research Center, Watershed Partnerships, Endangered Species projects	Hawaii Invasive Species Council, Invasive Species Program (Wildlife), Forest Health, Special Technology Development Program, competitive grants	Statewide	2. Develop new tools to increase effectiveness of invasive species management, including biological control.
				11		
	 Acres surveyed/ treated for incipient invasive species 		Council of Hawaii	Information Node		containment for species with limited distributions.
	pests by quarantine agencies		private landowners, Landscape Industry	DOD, USGS Pacific Basin	natural areas.	supporting island-wide cradication and
	forest weeds and	 Hawaii Invasive Species Council 	TNC, Hawaii Counties,	Watershed Partnerships,	lands and	networks, and
3.5	interceptions of	Forest Health grants	HDOH, DBEDT, UH,	Community Forestry,	agricultural	early detection
3.4	• Number of	Pest Species	CBP, DHS, HDOA, DOT,	Health, Urban and	roadsides,	policies, establishing
3.1	year	Coordinating Group on Alien	WS, USDA APHIS PPQ.	Program (Wildlife), Forest	interface areas,	improving biosecurity
2.2	cradications per	Invasive Species Committees	NRCS, USDA APHIS	Council, Invasive Species	arcas, urban	invasive species by
1.2	 Number of 	 Conveyance Tax, state funds, 	USFWS, NPS, USFS,	Hawaii Invasive Species	Ports, urban	 Prevent harm from new
Objectives					Area(s)	
Supports	Measures of Success	Resources Available/Required to	Key Stakeholders	Program Areas that Contribute	Priority Landscape	Long-term Strategy
						Forest Health

		9		

Hawaii Forest Health Strategies

П	.5	4.	,ω
	programs such as Urban and Community Forestry and Watershed Partnerships to ensure an integrative approach to management of invasive species.	Monitor invasive species and forest pests for trends to inform management activities	Increase public support and involvement in invasive species prevention and control.
		Ports, urban areas, urban interface areas, roadsides, agricultural lands and natural areas.	Statewide
	Forest Health, Urban and Community Forestry, Forest Stewardship, Wildfire Management, Conservation Education, competitive grants	Hawaii Invasive Species Council, Invasive Species Program (Wildlife), Forest Health Protection, Forest Health Monitoring, Urban and Community Forestry, Watershed Partnerships, competitive grants	Conservation Education, Hawaii Invasive Species Council, Invasive Species Program (Wildlife), Forest Health, Watersheds, Urban and Community Forestry, competitive grants
	Kaulunani, Forest Stewardship Council, Hawaii Association of Watershed Partnerships, Invasive Species Committees, Hawaii Invasive Species Council	USFWS, NPS, USFS, NRCS, USDA APHIS WS, USDA US Forest Service, NPS, USGS BRD, APHIS, HDOA, DOT, DBEDT, UH, TNC, Hawaii Counties, private landowners, Resource Mapping Hawaii, HAWP	Public, agricultural industry, horticultural industry, urban forest users and workers, land management agencies
	DOFAW and US Forest Service personnel	 Conveyance Tax, state funds, Hawaii Invasive Species Council Coordinating Group on Alien Pest Species Forest Health Monitoring Lab facilities 	 Hawaii Invasive Species Council funds State special funds HISC and CGAPS outreach staff Forest Service grants DOFAW staff
	Number of projects with multiple programmatic objectives	Acres surveyed for invasive plants or mortality	Number of new invasive species reports to the state hotline Increasing public support for natural resource protection Number of outreach events and presentations
	1.2 2.2 3.1 3.4 3.5	1.2 2.2 3.1 3.4 3.5	3.6

Reviewers for the forest health chapter of the SWARS include:

Pat Conant, Hawaii Department of Agriculture Lloyd Lloope, Unites States Geologic Survey - Biological Resources Division Teya Penniman, Maui Invasive Species Committee

Issue 3: Wildfire

Wildfire in Hawaii

Unlike ecosystems and forests in most of the continental states, Hawaii's ecosystems are not adapted to wildfire. Except in active volcanic areas, fire is not a part of the natural life cycle of native Hawaiian ecosystems, and only a few native species are able to regenerate after a fire. Wildfires in Hawaii place communities at risk, destroy irreplaceable cultural resources, cost taxpayers money, negatively impact drinking water supplies and human health, increase soil erosion, impact near shore and marine resources, and destroy native species and native ecosystems.

	Reduce the impacts of wildfires on communities	Reduce the impacts of wildfires on native ecosystems and watersheds	Long Term Strategy	Wildfire
	Communities at Risk	forest reserves, public hunting areas, wildlife and plant sanctuaries and natural area reserves	Priority Landscape Area(s)	
			Secondary Issues Addressed	
4	Cooperative Fire Assistance	Cooperative Fire Assistance	Program Areas that Contribute	
	HI Wildfire Mgmt. Organization; County Fire Departments; Community Associations; County Civil Defense	State Civil Defense; County Civil Defense; County Fire Departments; Volunteer Fire Departments; National Park Service; U.S. Forest Service; U.S. Army Garrison Hawaii; U.S. Fish & Wildlife Service	Key Stakeholders	
	State Fire Assistance; Wildland Urban Interface competitive grants	Dept. Firefighter Contingency Fund; State Fire Assistance; Volunteer Fire Assistance: Wildland Urban Interface competitive grants	Resources Available/required	
	Number of homes protected	Number of acres protected Number of homes & structures protected Number of populations of T&E species protected	Measure of Success	
	2.1 2.2 3.3 3.6	1.2 2.1 2.2 3.1 3.3 3.5	Supports National Objective	

Issue 4: Urban & Community Forestry

Hawaii's Urban and Community Forest is an Asset to the Community

forest, educate the community about trees, and to look at the urban forest as an integral component of the green infrastructure. The strategies and the priority landscapes identified here can provide that data and increase the knowledge and understanding of tropical other urban forestry leaders. Most apparent was the need to fund a tropical urban forest strategic plan, measure and map the urban The urban and community forestry strategies were identified and prioritized in a collaborative effort by the Kaulunani Council and urban trees.

Long Term Priority Landscape Strategy Areas(s) Addressed Contribute Counties Addressed Contribute Counties Addressed Contribute Counties	Long Term Strategy Areas(s) Areas(s) Areas(s) Areas(s) Areas(s) Areas(s) Areas(s) Addressed Contribute Urban canopy assessment & HI, for example Honolulu inventory Establish a Pacific Caribbean forestry research center Produce GIS Agriculture zoned Maps Assess urban forests in inventory and Kapolei, based on international impervious surfaces Tropical urban forests grants, U&CF State urban forest urban forests grants, U&CF State Urban canopy Assess urban forests in inventory impervious surfaces Tropical urban forest urban forest urban forest grants, U&CF State Urban canopy Assess urban forests in inventory urban forests urban forests grants, U&CF State Urban canopy Assess urban forests in inventory Urban forests urban forests urban forest grants, U&CF Hawai'i Territories UCF, scientists, non profits, governments, educational grants, U&CF Hawai'i Territories University of Hawai'i Territories University, scientists, non profits, governments, Hawai'i Tourism Authority Produce GIS Urban, coastal zone interface, University, practitioners, counties Ounties Ounties Ounties Ounties UCF, grants, UCF, Hawai'i Territories University, profits, counties Ounties Ounties One profits Ountiers University, practitioners, counties Ounties Ounties		U _T	ban and Comn	Urban and Community Forestry Priority One Goals	ty One Goals					
Urban canopy assess urban forests in assessment & HI, for example Honolulu in Hawai`i Urban canopy and Kapolei, based on Industry International forestry Industry In	Urban canopy Assess urban forests in inventory assessment & HI, for example Honolulu urban forests grants, U&CF State tropical urban Pacific & community Pacific & community Caribbean Pacific & community International Pablic outreach Public outrees Public outrees Public outrees Produce GIS Urban, rural, Maps			Long Term	Priority Landscape	Secondary	Program	Key	Resources &	Available	Available Measures of
Urban canopy	Urban canopy Assess urban forests in inventory assessment & HI, for example Honolulu inventory and Kapolei, based on in Hawai'i inventory Establish a Hawaii tropical urban & Pacific & community & Caribbean Fesearch center Caribbean International Fesearch center UCF Gullites Impervious surfaces Imperitive State Inventory			Strategy	Areas(s)	Issues	Areas that	Stakeholders	& Impleme	nting	nting Success
Urban canopy assessment & assessment & inventory inventory Assess urban forests in assessment & HI, for example Honolulu inventory inventory urban forests grants, U&CF Counties Establish a tropical urban • Hawaii Hawaii Competitive grants, U&CF State & community forestry • Pacific urban forest urban forest Competitive urban forest Competitive grants, U&CF Station & community research center • Industry urban forest urban forest Urban forest urban forest Urban forest urban forest UCF, educational forest urban forest UCF, educational forest urban forest UCF, educational forest urban forest UCF, educationers, educational grants, urban forest urban forest UCF, education forest urban forest urban forest UCF, educationers, education profits, counties, urban forest urban forest UCF, education forest urban forest urban forest UCF, education profits, urban forest UCF, e	Urban canopy					Addressed	Contribute		Partne	3	
assessment & HI, for example Honolulu invan forests inventory and Kapolei, based on impervious surfaces Establish a Hawaii Tropical tropical urban forest & Caribbean Pacific Caribbean (Caribbean forestry research center research center public outreach Public outreach Public outreach Amaps Maps HI, for example Honolulu urban forests grants, U&CF Utilities (Competitive tropical urban forest ward interface, interfa	assessment & HI, for example Honolulu urban forests inventory impervious surfaces Establish a tropical urban of Pacific & Carribbean of Pacific & Competitive & PSW Research of Competitive & PSW Research center of Pacific & Competitive of PSW Research county of County of PSW Research county of PSW Research county of PSW Research county of County of County of PSW Research county of PSW Research county of PSW Research county of County of PSW Research c	1000	ŗ.	Urban canopy	Assess urban forests in	inventory	Competitive	Counties	UCF,		Increased
inventory Establish a Establish a tropical urban & community research center UCF public outreach public outreach Maps Produce GIS Wildland/urban Interface, Interface, Interface, Interface, Interface, Interfaces International Inte	inventory impervious surfaces Establish a Establish a Establish a Establish a Facific Caribbean forestry research center Caribbean International resources UCF Produce GIS Maps Maps Inventory Produce GIS Maps Inventory Interface, Inventory International Inventory Educational Educational Inventory Educational Educational Inventory Educational Educational Inventory Educational Educational Inventory Education Education Interiace, Inventory Inventory Education Interiace, Inventory Inventory Education Interiace, Inventory Inventory Inventory Education Interiaces Inventory Invention Invention Inventory Inventory Inventory Inventory Invention Inventory Inventory Invention Invention Inventory Inventory Invention Invention Invention Inventory Inventory Invention Inventory Invention Inventity Inventity Inventition Invention Invention			assessment &	HI, for example Honolulu	urban forests	grants, U&CF	State	private/stake	holder	
Establish a Hawaii Tropical urban of Pacific urban & Pacific urban forestry of Caribbean Strategic plan forestry research center educational public outreach public outreach Produce GIS Urban, rural, Maps lands. We have interface, large impervious surfaces and county or state and county grants, U&CF Station grants, U&CF, educational with the public outreach public outreach public outreach interface, lands. Work Research Competitive prants, U&CF State and county county county county county county is tate and county profits, resources lands. Need for Jands. Need for State, Urban, rural, Med for Jands. Interface, wildland/urban interface, ounties counties counties counties counties counties lands.	Establish a Hawaii Caribbean Pacific Urban forestry Research center Public outreach Public Produce GIS			inventory	and Kapolei, based on	in Hawai`i	grants	Utilities	donations, cou	nty	
Establish a tropical urban competitive community county research center resources Public outreach public outreach Maps Maps * Hawaii * Hawaii competitive plan or early county research center resources interface, to maps not yet it ropical urban forest grants, U&CF Station * Hawaii * Hawaii competitive prants, U&CF Station strategic plan or plan forest plan county governments with the county governments presearch center public outreach or Public resources * Frequency of Hawaii * Tropical grants, UCF, educational & Public educational public outreach or Public educational public outreach or Public educational grants, resources educational grants, resources educational grants, counties profits, interface, inches interface, interface, interface, interface, interface, inte	Establish a tropical urban or Pacific urban forest tropical urban or Pacific urban forest tropical urban or Pacific urban forest urban forest tropical urban or Strategic plan or Strate and county county county or State and county or State and county grants, U&CF or Hawai'i state and county grants or State and county grants, or State and county grants, or State and county grants, or State, or State, Urban, rural, agriculture zoned lands. Produce GIS Urban, rural, lands. Interface, interfa	_			impervious surfaces			Non-profits	governments		
tropical urban & Pacific & community & Caribbean forestry research center CGaribbean strategic plan forestry research center COUCF educational & Public resources COUCF OUCF Applic outreach Public Resources COUNTY Produce GIS COUNTY Applic COUNTY COUNTIES COUNTY COUNTIES Inventory Educational Education Applic COUNTY COUNTIES CONSERVATION FORTIST Produce GIS COUNTE COUNTIES	tropical urban e Pacific with a community county forestry e International research center research rese		2	Establish a	Hawaii	Tropical	Competitive	PSW Research	PSW Research	Station,	Station, Research
& community forestry • Caribbean strategic plan Hawai'i state and county governments research center • International Inventory UCF, governments UCF • Industry Inventory UCF, existing educational public outreach Competitive educational public outreach Practitioners, scientists, non profits, resources Conservation Education Practitioners, governments, governments, Hawai'i Tourism Produce GIS • Urban, rural, agriculture zoned lands. Need for additional interface, unterface, wildland/urban interface, State, University, practitioners, non -profits, counties, counties UCF grants, counties, counties, counties University, practitioners, counties	& community forestry • Caribbean strategic plan Hawai'i state and county county governments research center • Industry Inventory UCF UCF, existing educational educational public outreach or public • Industry existing educational educational public UCF, existing educational grants, resources VCORETATION Practitioners, profits, non profits, non governments, education Practitioners, profits, profits, non governments, education Education Hawai'i Tourism Authority Produce GIS • Urban, rural, agriculture zoned interface, interface, interface, linterface, interface, linterface, interface,	Links		tropical urban	 Pacific 	urban forest	grants, U&CF	Station	University of H	awai`i	
forestry research center County governments County governments	forestry research center County governments			& community	Caribbean	strategic plan		Hawai'i state and	Arboretums, B	otanical	=
research center UCF educational & School age students public outreach resources Poublic Produce GIS Maps Produce GIS Wildland/urban interface, Wildland/urban Need for wildland/urban interface, Wildland/urban Wildland/urban School age students existing educational educational educational grants, competitive educational grants, counties wildland/urban interface, Wildland/urban Inventory Wildland/urban Inventory Wildland/urban Inventory Education Wildland/urban Wildland/urban Interface, Wildland/urban Interfac	research center UCF educational & School age students public outreach resources Poublic Produce GIS Produce GIS Urban, rural, Maps Produce GIS Urban/coastal zone interface, Urban interface, Invasive species in Produce GIS Produce GIS Urban/coastal zone interface, Invasive species in Inventory Inventory Educational grants, competitive scientists, non profits, competity scientists, non profits, competitive scientists, non profits, Education Reducational grants, competitive scientists, non profits, interface, in	_		forestry	 International 			county	Gardens,		
UCF educational & School age students public outreach Public resources Produce GIS Produce GIS Urban, rural, Maps Produce GIS Wildland/urban interface, Urban/coastal zone Urban/coastal zone interface, Urban/co	UCF educational & School age students public outreach Public resources Tourists Produce GIS Produce GIS Wildland/urban interface, Invasive species in UCF, Inventory of Hawai'i Territories Inventory of Hawai'i Territories Competitive scientists, non profits, resources educational grants, competitive scientists, non profits, competitive scientists, non profits, counties, lands. Wildland/urban interface, lnvasive species in UCF grants, counties counties, lands, counties counties, lands, lands interface, lnvasive species in UCF, Practitioners, competitive scientists, non profits, counties			research center				governments	Non profits, A	rborists,	rborists,
UCF Industry Inventory UCF, Competitive educational grants, Descriptioners, competitive educational grants, Competitive educational grants, Descriptioners, competitive educational grants, Conservation profits, conservation governments, Education Practitioners, conservation profits, education Education Hawai'i Tourism Authority Produce GIS • Urban, rural, agriculture zoned lands. Need for agriculture zoned lands. State, counties, practitioners, non -profits, counties Urban/coastal zone interface, Wildland/urban interface, wildland/urban interface, Urban/coastal zone interface, wildland/urban interface, Urban/coastal zone interface, wildland/urban interface, wildland/urban interface, Urban/coastal zone interface, wildland/urban interface, wildland/urba	UCF educational & School age students public outreach public outreach resources Produce GIS Maps Produce GIS Urban, rural, agriculture zoned interface, blands. Urban/coastal zone interface, linvasive species in Produce GIS Urban/coastal zone interface, linvasive species in Produce GIS Urban/coastal zone interface, linvasive species in Produce GIS UCF, competitive scientists, non profits, counties Produce GIS Urban/coastal zone interface, linvasive species in Produce GIS UCF, Competitive scientists, non profits, counties Producational grants, competitive scientists, non profits, counties							University of Hawai`i	FHUF		
educational & School age students educational grants, resources Public educational grants, resources Tourists educational grants, resources Conservation governments, Education Hawai i Tourism Authority Produce GIS Urban, rural, Maps agriculture zoned lands. Urban/coastal zone interface, Wildland/urban interface, Wildland/urban Ompetitive scientists, non profits, resources Education Hawai i Tourism Authority State, Conservation governments, Education Hawai i Tourism Authority Value of for State, Muthority Outhority Produce GIS Urban, rural, additional counties, practitioners, non profits, counties	educational & School age students educational grants, public outreach Public educational grants, resources Public educational grants, resources Conservation governments, Education Hawai i Tourism Authority Produce GIS Urban, rural, agriculture zoned lands. Urban/coastal zone interface, Wildland/urban interface, Invasive species in Invasive sp	$\overline{}$	۱	ICE	• Industry	Inventory	IICE	Practitioners	llea IICE arran	for	
public outreach Public Public Pourists Produce GIS Maps Maps Produce GIS Urban, rural, agriculture zoned interface, interfac	public outreach resources Tourists Tourists Produce GIS Maps Produce GIS Urban, rural, agriculture zoned interface, interface, lands. Public outreach Produce GIS Urban/coastal zone interface, lands/urban interface, lands/urban/urban interface, lands/urban/urban interface, lands/urban/u		'n	UCF	• Industry	Inventory	UCF,	Practitioners,	Use UCF grant	for	
resources Tourists resources Conservation governments, resources Education Hawai'i Tourism Produce GIS Urban, rural, Agriculture zoned lands. Urban/coastal zone interface, Wildland/urban interface, Interface	resources Tourists resources Conservation Guarding Features, Frontiers, Front	_		public outroach	• Dublic	educational	compenate	profits	Drivato /stales		
Produce GIS Urban, rural, Maps agriculture zoned lands. Urban/coastal zone interface, Wildland/urban Education Hawai`i Tourism Authority State, Counties, University, practitioners, non -profits, counties	Produce GIS Urban, rural, Maps agriculture zoned lands. Urban/coastal zone interface, Invasive species in Education Red for State, Maditional counties, maps not yet UCF grants, practitioners, non -profits, counties Education Authority Authority			resources	• Tourists	resources	Conservation	governments,	donations	Holder	education grant
Produce GIS Urban, rural, Maps agriculture zoned additional counties, lands. Urban/coastal zone determined interface, wildland/urban Need for State, maps not yet UCF grants, practitioners, non -profits, counties	Produce GIS Urban, rural, Maps agriculture zoned additional counties, University, lands. Urban/coastal zone interface, Wildland/urban interface, Invasive species in Need for State, Counties, University, maps not yet uCF grants, practitioners, non -profits, counties					ø	Education	Hawai`i Tourism			proposed
Produce GIS - Urban, rural, Maps - agriculture zoned lands. - Urban/coastal zone interface, - Wildland/urban interface,	Produce GIS - Urban, rural, Maps - agriculture zoned lands. - Urban/coastal zone interface, - Wildland/urban interface, - Invasive species in - Urban, rural, - additional counties, - maps not yet uCF grants, practitioners, - determined determined counties, - counties							Authority			
agriculture zoned additional counties, University, lands. • Urban/coastal zone interface, • Wildland/urban interface,	agriculture zoned additional counties, University, lands. • Urban/coastal zone interface, • Wildland/urban interface, • Invasive species in		.	Produce GIS		Need for	State,	State,	DOFAW, Use	UCF	UCF Priority
/coastal zone determined determined non - profits, counties ace, ace, ace, ace, ace, ace, ace, ace,	roastal zone determined UCF grants, practitioners, non – profits, counties nd/urban ace, ve species in UCF grants, practitioners, non – profits, counties			Maps	agriculture zoned	additional	counties,	University,	funds for GI	maps,	ps,
pastal zone determined /urban	pastal zone determined /urban species in				lands.	maps not yet	UCF grants,	practitioners,	County data		mapped
/urban	/urban , species in				 Urban/coastal zone 	determined		non -profits,			•
Wildland/urban interface,	 Wildland/urban interface,				interface,			counties			
interface,	• Invasive species in				 Wildland/urban 						
	Invasive species in				interface,		24				

	8			
			,	

G	ω	?	1.	Ur	ù	1
ban and Comm	Demonstration urban-watershed project	Mitigate environmental impacts of urbanization	Tropical U&CF management plan	ban and Comn Long Term Strategy	Outsource UCF program	
Urban and Community Forestry Priority Three Goals	Identify partners, project site and urban watershed	Future development, watersheds, areas with high impervious surfaces	All Hawai`i counties	Urban and Community Forestry Priority Two Goals Long Term Priority Landscape Secondary Strategy Areas(s) Issues Addressed	 Outsource program to a non profit 	urban -wildland Future urban development, Impermeable surfaces, Canopy cover, Stream channels through urban areas
rity Three Goa	Collaboration with watershed partners	Base line research for tropical low impact development tools	Identify plans, policies, ordinances, rules and laws impacting Hawaii's urban forest	Secondary Issues Addressed	Ability to attract additional funds	9.
ls	U&CF, watershed partners	Watershed, DOFAW, U&CF, counties	U&CF grants, Western competitive grants, counties	Program Areas that Contribute	UCF and competitive grants	
	UCF, watershed partners,	Counties, watershed partners, University, USACE	Public, decision makers, county parks and recreation, county arborists county planning practitioners	Key Stakeholders	Non profit, DOFAW, UCF Council	
	Watershed partners, UCF to fund trees	Watershed partnerships, use UCF funds, University CTAHR, Counties, non profits.	Counties, non-profits, UCF funds, University	Resources Available & Implementing Partners	UCF grants, competitive grants, private/stakeholder donations	
	Template for urban-watershed projects	New standards for low impact development developed	UCF management plan template developed and implemented	Measures of Success	Program expanded, new donor base, more opportunities for funding and projects.	
	3.1 3.4 3.6	2.2 3.1	1.2 2.2 3.4 3.7	Supports National Objectives	1.2 3.4 3.6 3.7	

			,	

	species							
	coastal tree	UCF funds		grant			sea level rise	
3.7	appropriate	Coastal Lands		competitive	area	rise	the effects of	
3.6	areas and	Conservation and	U&CF	western	in coastal	areas based on sea level	tool to mitigate	
3.4	Vulnerable	State - Office of	State, County,	UCF, Coastal,	Tree species	Vulnerable urban forest	Use trees as a	2.
			Committee				المراجعة الم	Γ
			Species			gardens		
			HI Invasive		rewards	nurseries and botanical	ecosystems	
			DLNR, DOFAW,		grower	ports of entry, and	forest on native	
	interface.		gardens, ASLA,		trade,	Commercial industry,	the urban	
	urban/wildland		botanical		plants in		species from	
	species in		colleges,	grant	invasive	wildland interface	invasive	
3.6	invasive	CGAPS	nurseries, UH,	competitive	and non	outbreaks in the urban	impacts of	
2.2	Mapped	State, federal, UH,	Private	State, U&CF,	More native	Urban invasive species	Mitigate	i.
Objectives		Partners		Contribute	Addressed			Γ
National	Success	& Implementing	Stakeholders	Areas that	Issues	Areas(s)	Strategy	
Supports	Measures of	Resources Available	Кеу	Program	Secondary	Priority Landscape	Long Term	
								1

*			

Issue 5: Climate Change/Sea Level Rise

small islands will likely include a rise in mean sea-level, increased frequency and severity of storms, increased incidences of flash flooding, and changes in rainfall. Small islands will have to develop strategies to adapt to these changes, and to mitigate their impacts. There is an emerging consensus that the climate of the planet is changing as a result of human-induced activities. The impacts on

	adaptation					
	to facilitate climate					
	activities designed					
	management					
	effectiveness of		USACE			
	assessing the		USGS, NWHI, EPA,			
	sufficient for		Earth Sciences,			
	systems are		School of Ocean &			
	→ Monitoring		University of Hawai'i			
	biodiversity		NWS, DOD, CWRM,			
	Hawaiian		Management, NOAA	À		
	knowledge of		Coastal Resource			
	gaps in baseline	⇒ USACE	Office of Ocean &			
	that fills existing	⇒ USDA Forest Service	Conservancy, NOAA =			
	New monitoring	⇒ NASA	The Nature =			
	and ecosystems.	Weather Service	USDA, HDOA, DOT,			and monitoring systems.
	trends in climate	→ NOAA and National	NPS,	volunteer groups		and enhance data collection
	local and regional	students	(PICCC),	Education, schools,		(SIIS) to identify data gaps
	evaluations of	scientists and graduate	Change Cooperative	Forestry, Conservation		Improvement Strategy
	improving the	University of Hawai'i	Islands Climate =	Urban & Community		Instrumentation
	instrumentation for	⇒ USGS	Alliance, Pacific =	Health Protection,		coordinated Statewide
	→ New	USFWS (on NWHI)	Hawai'i Conservation	Fire & Aviation, Forest	Statewide	I. Develop and implement a Statewide
Objectives		implement			Area(s)	
National	Success	Required to		Contribute	Landscape	
Supports	Measures of	Resources Available/	Key Stakeholders	Program Areas that Key Stakeholders	Priority	Long-term Strategy

6			

			Program	28		
			OH Sea Grant			
			Co Coast Ouaire,			
			I IS Coast Guard		•	
			Corps of Engineers		•	
			Council, US Army			
	390		Zone Advocacy		-	
			Marine & Coastal			
			of Kauai, DOH,			
			Planning for County			
			Department of			
	a composition.					
	adaptation		of Maui.			
	toward facilitated		Planning for County			
	contribute		Department of			
	acuvines can		oi riawai i,			
	000000000000000000000000000000000000000		of University			
	management		Planning for County			
	of how land		Department of			
	and assessments		Honolulu,			
	on risk analyses		City and County of		•	
	· · · · · ·		or the orbits			
	outcomes based		of Water Supply			
	beneficial		Conservancy, Board			
	with the most	9	HDOA, The Nature			
	prioritize actions		or Planning,			
	- Program areas		NPS, DOI, Office			
			Authority, Our way	I I Ogram		
	landinana		Authority LIGEWIC	Drogram		
	resources and	4	Hawai'i Tourism	Enhancement		(
	ecosystems.	→ DOFAW staff		Forest Land		climate change.
	scenarios for	UH	Services Center,	Forest Stewardship,		future scenarios of
	to climate change	and Policy (ICAP) at	NOAA Pacific	WHIP, Forest Legacy, NOAA Pacific		knowledge of trends and
	capacity to adapt	Climate Adaptation	Management,	Aviation, EQIP,		ecosystems using
	sensitivity, and	-> Center for Island	Coastal Resource	Partnerships, Fire &		infrastructure, and
	exposure,	competitive grants	Office of Ocean &	Watershed		important resources,
	describe	→ USDA Forest Service	Alliance, NOAA	Health Protection,		opportunities for
	assessments that	(PICCI)	Conservation	Forestry, Forest	coastal zones	vulnerabilities, risks, and
	→ Vulnerability	ent of Interior	Hawai'i	Urban & Community	Urban and	2. Assess the
Objectives		Implement			Area(s)	
National	Success	Required to	Trey Council Class	Contribute	Landscape	
CIDDON	Measures of		\neg	Program Areas that	Priority	Long-term Strategy

	e e			

				- I A	34	
Long-term Strategy	Landscape	Contribute	ney stakenoluers	Required to	Success	National
	Area(s)			Implement		Objectives
3. Develop and implement	Urban and	Urban & Community	Hawai'i Conservation	ICAP	→ Adoption of a	
facilitated adaptation	coastal zones	Forestry, Forest Health	Alliance, NOAA	Department of Interior	State of Hawai'i	
strategies for forest and		Protection, Watershed	Office of Ocean &	programs (PICCC)	climate change	
esource conservation		Partnerships, Fire &	Coastal Resource	1	adaptation plan	
nanagement; monitor		Aviation, EQIP, WHIP,	Management, NOAA		→ Implementation of	
effectiveness; continually		Forest Stewardship,	Pacific Services		anticipatory	
ncorporate new		Forest Legacy, Forest	Center, OHA, DOD,		actions intended to	
nformation: and adjust		Land Enhancement	Hawai'i Tourism		prevent serious	
actions as needed.		Program	Authority, USFWS,		disruptions in	
		ć	NPS, DOT, Office of		forests and	
			Planning, HDOA, The		ecosystem services	
			Nature Conservancy,		due to changing	
	-		Board of Water		climate.	
			Supply, City and		→ Implementation of	
			County of Honolulu,		opportunistic	
			Department of		actions that take	
		*	Planning for County		advantage of man-	
			of Hawai'i,		made or natural	
			Department of		disturbance events	
			Planning for County		to facilitate	
			of Maui, Department		adaptation to	
			of Planning for		future climate.	
		Agreement of the second	County of Kauai,		→ A reiterative	
			DOH, Marine &		process, involving	
		A	Coastal Zone		continual	
			Advocacy Council,		monitoring and	
			US Army Corps of		incorporation of	
			Engineers, US Coast		new science into	
		100	Guard, UH Sea Grant		planning, policies,	
			Drogram		and decisions	

Coastal industries, Forest Stewardship Forest Stewardship Innumber of funds Success Innumber of funds Success Innumber of funds Individuals, Specializing in climate change Education Program Alliance, NOAA Forest Land Services Center, USFWS, NPS, US Army Corps of Engineers, The Nature Conservancy, UH Sea Grant Program Strategies, and actions for addressing climate change Innovative Engineers, and actions for addressing climate change Institutional and actions for addressing climate change Institutions Institution Institutio		programs areas.					
Coastal industries, ⇒ Forest Stewardship schools, Hawai'i ⇒ Forest Land schools, Hawai'i ⇒ Forest Land specializing in Conservation Alliance, NOAA funds Education Program adaptation and funds climate change Education Program adaptation and mitigation, who deducate programs (PICCC) landowners, management, NOAA Pacific Services Center, USFWS, NPS, US Army Corps of Engineers, The Rea Grant Program Conservancy, UH Sea Grant Program Strategies, and adaptation adaptation adaptation strategies, and actions for addressing climate change are integrated are integrated conservancy climate change are integrated conservancy climate change climate chan		across all					
Required to Implement Coastal industries, funds schools, Hawai'i Tourism Authority, Education Program Alliance, NOAA Alliance, NOAA Alliance of Ocean & Department of Interior Coastal Resource Management, NOAA Pacific Services Center, USFWS, NPS, US Army Corps of Engineers, The Nature Conservancy, UH Sea Grant Program Sea Grant Program Conservance of Department of Interior Conservancy, UH Sea Grant Program Strategies, and actions for addressing climate change change Success funds Education Program Education Program Alliance, NOAA funds Department of Interior educate programs (PICCC) Individuals, indivi		are integrated					
Required to Implement Coastal industries, ⇒ Forest Stewardship Authority, ⇒ Forest Land Success Individuals, ⇒ Forest Land Individuals, ⇒ Forest Land Individuals, ⇒ Forest Land Individuals, ⇒ Conservation Individuals, ⇒ Conservation ⇒ Conservation Alliance, NOAA Alliance, NOAA funds ⇒ Department of Interior Interior Individuals, ⇒ Conservation Alliance, NOAA Individuals, ⇒ Conservation ⇒ Conservation Authority, ⇒ Department of Interior Individuals, ⇒ Conservation ⇒ Department of Interior Individuals, ⇒ Individuals, ⇒ Conservation ⇒ Department of Interior Individuals, ⇒		climate change					
Coastal industries, Forest Stewardship Implement		addressing			g de la constant de l		
Coastal industries, landowners, funds schools, Hawai'i Forest Stewardship trained schools, Hawai'i Forest Land Enhancement funds Conservation Alliance, NOAA Alliance, NOAA Pacific Services Center, USFWS, NPS, US Army Corps of Engineers, The Nature Conservancy, UH Sea Grant Program Secondary in Strategies, and publicies, and policies, and policies are program prosent program programs policies.		actions for					
Coastal industries, landowners, schools, Hawai'i		policies, and					
Coastal industries, Forest Stewardship Forest Stewardship Implement		→ Strategies,	u				
Coastal industries, Forest Stewardship Industries Forest Stewardship Individuals, schools, Hawai'i Forest Land Forest Land Individuals, specializing in Conservation Education Program Education Program Alliance, NOAA Department of Interior educate programs (PICCC) managers, and the public Services Center, USFWS, NPS, US Army Corps of Engineers, The Nature Conservancy, UH Sea Grant Program Sea Grant Program Sea Grant Program Conservancy		adaptation					
Coastal industries, Forest Stewardship Forest Stewardship Trained schools, Hawai'i Forest Land Forest Land Specializing in Hawai'i Forest Land Specializing in Conservation Education Program Alliance, NOAA Forest Land Specializing in Conservation Education Program Army Corps of Engineers, The Nature Conservancy, UH Sea Grant Program Services for		facilitated					
Coastal industries, landowners, schools, Hawai'i Forest Stewardship Forest Land specializing in Hawai'i Forest Land Specializing in Education Program Authority, Conservation Alliance, NOAA Alliance, NOAA Pacific Services Center, USFWS, NPS, US Army Corps of Engineers, The Nature Conservancy, UH Coastal industries, Implement		approaches for		Sea Grant Program			
Coastal industries, landowners, schools, Hawai'i Forest Stewardship Forest Land specializing in Hawai'i Forest Land Specializing in Education Program Adaptation and Alliance, NOAA Alliance, NOAA Pacific Services Center, USFWS, NPS, US Army Corps of Engineers, The Nature Coastal industries, Forest Stewardship Number of Interior funds individuals, specializing in Education Program adaptation and mitigation, who educate programs (PICCC) landowners, managers, and the public support and public support for implementing		innovative		Conservancy, UH			
Coastal industries, landowners, schools, Hawai'i Forest Stewardship Forest Land specializing in Hawai'i Forest Land Specializing in Education Program Adliance, NOAA Alliance, NOAA Pacific Services Center, USFWS, NPS, US Army Corps of Engineers, The Resource Roastal Resource Regimeers, The Resource Regimeers, The Resource Regimeers Regimeers Resource Regimeers Regi		for implementing		Nature			
Coastal industries, Forest Stewardship Implement		encouragement		Engineers, The			
Coastal industries, schools, Hawai'i Forest Stewardship Forest Land Individuals, specializing in Hawai'i Conservation Alliance, NOAA Office of Ocean & Department of Interior Educate Programs (PICCC) Management, NOAA Pacific Services Center, USFWS, NPS, US Prorest Stewardship Trained individuals, specializing in Education Program adaptation and mitigation, who educate programs (PICCC) Management, Management, USFWS, NPS, US Required to Success Forest Stewardship Trained individuals, specializing in climate change adaptation and mitigation, who educate programs (PICCC) Figure 1		and	4	Army Corps of			
Coastal industries, Forest Stewardship Forest Stewardship Individuals, schools, Hawai'i Forest Land Enhancement funds Enhancement funds Conservation Education Program Alliance, NOAA Office of Ocean & Department of Interior Educate Programs (PICCC) Indowners, and NOAA Pacific Services Center, Services		public support		USFWS, NPS, US			1
Coastal industries, Forest Stewardship Individuals, schools, Hawai'i Forest Land Forest Land Individuals, specializing in Hawai'i Conservation Enhancement funds Conservation Education Program Alliance, NOAA funds Office of Ocean & Department of Interior Educate Programs (PICCC) Iandowners, managers, and the public Individuals, specializing in Conservation Climate change adaptation and mitigation, who Educate programs (PICCC) Iandowners, managers, and Individuals, specializing in Climate change adaptation and mitigation, who Individuals, specializing in Conservation Education Program adaptation and mitigation, who Individuals, specializing in Conservation Education Program adaptation and mitigation, who Individuals, specializing in Individuals, speci		⇒ Institutional and	-11	Services Center,			adaptation.
Coastal industries, schools, Hawai'i Forest Land Enhancement funds specializing in Hawai'i Conservation Alliance, NOAA Alliance, NOAA Office of Ocean & Department of Interior Educate programs (PICCC) Management, Schools, Hawai'i Forest Land individuals, specializing in Conservation Conservation Education Program adaptation and mitigation, who educate programs (PICCC) Interior educate landowners, managers, and		the public		NOAA Pacific			climate change
Coastal industries, schools, Hawai'i Forest Land Enhancement funds Specializing in Hawai'i Conservation Alliance, NOAA Alliance, NOAA Office of Ocean & Department of Interior educate programs (PICCC) Section 1 (PICCC) Section 2 (PICCC) Section 3		managers, and	1	Management,	Program		collaborative approach to
Coastal industries, Forest Stewardship Industries Forest Stewardship Number of trained schools, Hawai'i Forest Land Forest Land Individuals, indi		landowners,	programs (PICCC)	Coastal Resource	Land Enhancement		ensure a coordinated and
Coastal industries, Forest Stewardship trained schools, Hawai'i Forest Land Specializing in Hawai'i Conservation Alliance, NOAA funds Required to Implement		educate	⇒ Department of Interior	Office of Ocean &	Stewardship, Forest		and stakeholders to
Required to Success Implement		mitigation, who		Alliance, NOAA	WHIP, Forest		other programs, agencies,
Required to Implement Coastal industries, ⇒ Forest Stewardship ⇒ Number of trained schools, Hawai'i ⇒ Forest Land individuals, Enhancement funds Hawai'i ⇒ Conservation climate change		adaptation and	Education Program	Conservation	Aviation, EQIP,		and partnerships with
Coastal industries, Forest Stewardship Industries Forest Stewardship Number of trained schools, Hawai'i Forest Land individuals, specializing in		climate change		Hawai'i	Forestry, Fire &		establish strong alliances
Required to Implement Coastal industries, ⇒ Forest Stewardship ⇒ Number of trained schools, Hawai'i ⇒ Forest Land individuals,		specializing in	Enhancement funds	Tourism Authority,	Urban & Community		changing conditions; and,
Coastal industries, → Forest Stewardship → Number of Iandowners, funds trained		individuals,		schools, Hawai'i	Heath Protection,		and the public understand
Required to Success Implement Coastal industries, ⇒ Forest Stewardship ⇒ Number of		trained	funds	landowners,	Education, Forest		conservation managers,
Required to Success Implement				Coastal industries,	Conservation	Statewide	4. Help landowners,
Required to Success	Objectives		Implement			Area(s)	
	National	Success	Required to		Contribute	Landscape	(
Program Areas that Key Stakeholders Resources Available/ Measures of Supports	Supports	Measures of	Resources Available/	Key Stakeholders	Program Areas that	Priority	Long-term Strategy

Issue 6: Conservation of Biodiversity

Protection of Hawaii's biodiversity is one of the main functions of the Department of Land and Natural Resources. water and nutrient cycling. Hawaii's unique ecosystems are also vulnerable to introduced insects, plants, animals and diseases. extraordinary diversity of habitats has lead to the development of unique species and ecosystems found nowhere else in the world. These ecosystems have intrinsic value, and also provide the residents of these islands with essential ecosystem services such as food, The biological heritage of Hawaii is unparalleled in the world. The extreme isolation of the Hawaiian archipelago, combined with an

Biodiversity (Biodiversity Objective/Management Strategy: Maintenance of native ecosystems and species	Strategy: Ma	ntenance of	native ecosys	tems and species.		
Long Term Strategy	Priority Landscape Areas(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available & Implementing Partners	Measures or Success	Supports National Objectives
1) Engage in	See	Other	Various	Public and	Contributing program areas:	Invasive species removed	1
conservation to	" TBD Maintenance"	ecosystem	governmental	private	facilities and infrastructure	 Acres of fenced, ungulate free habitat, created and 	1.2
maintain intact	Category of Map.	services	and private	iandowners	including (e.g. captive	maintained	2.1
native	Landscapes dominated	including	programs	and	breeding facilities, seed	Acres of predator controlled habiat	2.2
ecosystems and	by native species with	water quality	incl: Forest	conservation	storage, nurseries); research	 Acres protected by fuel breaks created 	ω,
species	intact structure and	and quantity,	health,	agencies and	and monitoring technologies	and/maintained	သ
(including plants,	function. And critical,	flood control,	Competitive	organizations	and partnerships (e.g. aerial	 Number of native species re-introduced 	3.6
forest birds, and	essential or recovery	open space,	grants,	including	imagery); natural resource	 Plant genetic materials secured in seed storage 	ა. თ
invertebrates)	habitats as identified in	ecotourism	Section 7	DLNR, HAWP	management personnel,	facilities.	
	Hawaii's Comprehensive		USFWS	partners, TNC,	existing partnerships (e.g.	 Monitoring of rare plant and animal populations 	
	Wildlife Conservation		funding,	rare plant	Watershed Partnerships)	 Native range, widespread plant communities 	
	Strategy (CWCS) and by		USFS,	nurseries, seed	PEP, USFWS, USFS	established	
	Sign COI WO.		0	facilities. PEP			
2) Maintain	• See	See above	Competitive	DLNR, Public	Public and private HAWP	In addition to the measures detailed above, this strategy	:
native	" TRD Maint		grants,	and private	partners, TNC, NAPP, NARS,	would also measure:	1.2
dominated	Charles and Category		Forest	landowners,	rare plant nurseries, seed		2.2
ecosystems (50	elialice caregory		Stewardship,	HAWP	storage facilities, PEP,	 Acres of habitat maintained for waterbirds 	ω
- 100% native)	or map		Section 6	partners, TNC,	DOFAW nurseries,	24	3.5
including	 Native forests, 		grants, forest	NAPP, NARS,			3.6
waterbird habitat	grasslands, &		legacy	rare plant	(maybe see above?)		
and intact	shrublands) as		funding,	nurseries, seed			
CUasiai siles.	designated by the		(maybe see	facilities, PEP			
	newly developed		above?)				
	hq combo AND			(should this just			
	NOT in Enhance			state: "see			
	category AND			above"?)			
	support ≤100 spp						

	40		
e	e.		

Hawaii Biodiversity Strategies2

3.5 3.5	 Invasives removed, Natural native plant regeneration. Length of barriers created to control the introduction of habitat modifying weeds and predators 	Public and private HAWP, partners, TNC, NAPP, NARS, rare plant nurseries, seed storage facilities, PEP	Public and private landowners, DLNR, TNC,	Competitive grants, Forest Stewardship,		High quality restoration sites 1km from a native-dominated landscape	4) Restoration of landscapes with high potential for successful
Supports National Objectives	Measures of Success	Resources Available & Implementing Partners	Key Stakeholders	Program Areas that Contribute	Secondary Issues Addressed	Priority Landscape Areas(s)	Long Term Strategy
				storation	Strategy: Re	Biodiversity Objective/Management Strategy: Restoration	Biodiversity C
	• See above	(maybe see above) Public and private HAWP partners, TNC, NAPP, NARS, rare plant nurseries, seed storage facilities, PEP, DOFAW nurseries,	(maybe see above) DLNR, Private landowners, State Forest Lands and priority mitigations and restoration sites;	(maybe see above) Forest Health, Watershed health and protection, Forest stewardship, Landowner assistance programs, competitive	See above	Enhancement sites (please refer to map)	3) Enhance native dominated habitat with formerly widespread plant species that are now limited in range
Supports National Objectives	Measures of Success	Resources Available & Implementing Partners	Key Stakeholders	Program Areas that Contribute	Secondary Issues Addressed	Priority Landscape Areas(s)	Long Term Strategy
			e habitat	hance nativ	itrategy: En	Objective/Management Strategy: Enhance native habitat	Biodiversity O
						very good (~6-29 native spp).	
		*				TNC as good to	
						 Any coastal area designated by 	
						concentrations.	
				50.		waterbird	
						Areas with FWS	
						plants,	

•		

Hawaii Biodiversity Strategies3

National Objectives	megan to en megan	Implementing Partners	Key Stakeholders	Areas that Contribute	Secondary Issues Addressed	Priority Landscape Areas(s)	Long Term Strategy
Supports	Measures of Success	A TOTAL OF		her??	Strategy: Ot	Biodiversity Objective/Management Strategy: Other??	Biodiversity O
	more information.		0		Outreach and education	Areas where habitat conservation has minimized the likelihood of successful restoration of native biodiversity.	6) Degraded land management
National Objectives	measures of Success	Resources Available & implementing Partners	Key Stakeholders	Program Areas that Contribute	Secondary issues Addressed	Priority Landscape Areas(s)	Long Term Strategy
0			unity	nited Opport	Strategy: Lin	Biodiversity Objective/Management Strategy: Limited Opportunity	Biodiversity O
3 N i	Number of continuit halive plants populations Number of constituent native plants genetically and Number of constituent native plants genetically and historically appropriate to location Soil testing and soil improvement if necessary.	Public and private HAWP, partners, TNC, NAPP, DOFAW and partner nurseries, rare plant nurseries, seed storage facilities, PEP	Public and private landowners, TNC, DLNR	Invasive Species Committee	Information and education	Restoration sites with high value post restoration: wetlands, coastlines, etc.	5) Localized restoration in non-native dominated areas with localized potential for restoration.
3.5 3.5 3.5		Public and private HAWP, partners, TNC, NAPP, NARS, rare plant nurseries, seed storage facilities, PEP	Public and private landowners, DLNR, TNC, PEP, HAWP partners, DOD rare plant nurseries, seed storage facilities	Competitive grants, Forest Stewardship, mitigation funds, Section 6 funding		High quality restoration sites 1km from a native- dominated landscape	4) Restoration of landscapes with high potential for successful restoration due to their proximity (within 1km) to substantial areas of native-dominated vegetation.

http://www.fws.gov/ecos/ajax/tess_public/pub/stateListingIndividual.jsp?state=Hl&status=listed lists 377 species. These in addition to the 48 species listed on the Federal Registry April 13, 2010 is 425 Federally listed T&E species. USFS is in the process of updating their website.

Issue 7: Recreation and Tourism

Strategy: Recreation and Tourism

Residents and visitors alike engage in recreational opportunities enhanced by Hawaii's unique natural resources. The impact of a degraded environment in general would not only diminish Hawaii's attraction to visitors but also impact the lives of our resident population whose recreational, cultural, subsistence and physical health are often closely linked with the health of the land.

'n	.2	1	Rec
Promote responsible behavior and preservation of natural and cultural resources through understanding and stewardship of these resources.	2. Preserve open space and natural settings through public acquisition, conservation easements, and (other?).	Provide public access to natural areas for outdoor recreation, including mountain/forest areas for hiking, camping, and picnicking	Recreation and Tourism: Provide Public Access to Natural Areas Long Term Strategy Priority Landscape Secondary Issues Addressed
Public recreation areas.	- Public recreation areas	Public recreation sites, and right of entry through applicable private lands	Public Access to Priority Landscape Areas(s)
 Awareness of the impact of invasive species on natural areas 		• Impacts of recreational access on resources.	Natural Areas Secondary Issues Addressed
Government & community partnerships and volunteer programs, eco-tourism companies, Park	State and County Planning offices, NOAA-CELCP, NPS-LWCF, State Legacy Land	Na Ala Hele, NARS, DOFAW, State Parks, NPS	Program Areas that Contribute
Hawaii Tourism Authority (HTA), State Parks, NPS, County Parks, DOFAW	Residents, visitors	State Parks, NPS, County Parks, Na Ala Hele, DOFAW, NARS, USFS, TNC, private landowners	Key Stakeholders
 TAT and HTA State special funds 	 Federal grants (LWCF, CELCP) Land Trusts, Trust for Public Land County "open space" funds State Conveyance Tax 	 Conveyance Tax, state funds Federal grants (LWCF, CELCP) TAT and HTA 	Resources Available & Implementing Partners
 Increase in interpretive materials available to visitors Increase in public support for stewardship projects 	 Increased acreage under public ownership or control for recreation Expansion of park systems 	 Increase in number of people using recreation areas per year Reduced user conflicts 	Measures of Success
			Supports National Objectives

Strategy: Recreation and Tourism

resource problems,		, and	communication between	4. Increase effective Human								research & monitoring		effectively manage game	2. Increase the capacity to Public hunting							of the		statutes (HRS 183D & 195D) leasable private	1. Comply with relevant state Forest reserves,	Addressed	cape Se	ı
Forest Health,	Program (Wildlife),	Invasive Species	Species Council,	Hawaii Invasive				4				Res. & Env. Mgmt.	Manoa Dept. of Nat.	USGS-PIRG, UH-	Wildlife Program,									& Access Program	Na Ala Hele Trails		Program Areas that	
,	agencies	management	resource	Public, land &								Partnerships	Watershed	communities, UH,	Hunters, rural		4			private landowners	Hawaii Counties,	communities,	hunters, rural	recreationalists,	Outdoor		Key Stakeholders	
Wildlife Education &	 Forestry & 	Alliance	Conservation	Hawaii	institutions	of state & federal	 Research capacity 	ammunition)	guns &	(from taxes on	Restoration Funds	Wildlife	Robertson	• Pittman-	 Fees from hunters 	parcels	Appropriate land	ammunition)	guns &	(from taxes on	Restoration Funds	Wildlife	Robertson	Pittman-	Fees from hunters	Partners	Implementing	Amilable 0
management & protection initiatives	participation in	cooperation &	increased	 Reduced conflict & 				population numbers	desirable game	estimates of	 Number of plans & 	estimates	basic population	game species with	 Number of areas & 	hunting	removed from	acres added for &	 New, appropriate 	harvested	game mammals	days in the field,	number of hunter	licenses sold,	 Number of hunting 		Measures of Success	Manager of Change
		3.6	3.4	2.2									3.6	3.4	2.2				=1107					3.6	3.4	Objectives	National	Commonto

Strategy: Recreation and Tourism

							Alliance (HEEA)
							Hawaii Environmental Education
							2. Maintain a relationship with the
						Tropical Forest	
		4				Experamental	
						Federal	
						Forests and the	
		,,,,,,,				Hawaii's State	1. Children's Forest
Objectives		Partners			Addressed		
National		Implementing		Contribute	Issues	Areas(s)	
Supports	Measures of Success	Resources Available &	Key Stakeholders	Program Areas that	Secondary	Priority Landscape	Long Term Strategy
			-			ach and Education	Recreation and Tourism: Outreach and Education
	protection						
	management &	staff				•	
	resource	CGAPS outreach					
	support for natural	HISC and					
	 Increasing public 	Outreach		Partnerships, NARS			

TAT = Transient Accommodation Tax administered by HTA; \$1m annually to State Parks and Trails.
HTA = Hawaii Tourism Authority
CELCP = Coastal Esturine Land Conservation Program

		*	
			×

Issue 8 : Forest Product Strategies

the development of a viable forests products industry. state result in some of the highest growth rates for woody biomass in the world. Since the mid 1970's Hawaii has been encouraging Hawaii has not traditionally maintained a large-scale forest products industry. Nevertheless, growing conditions in many parts of the

refrom Strategy Landscape Area(s) Landscape Landscape Area(s) Landscape Landscape Landscape Landscape Landscape Area(s) Landscape							
Priority Landscape Landscape that Contribute Area(s) Conservancy,		Key existing literature and research documented and results disseminatated and available on approriate clearinghouses, webistes, at research stations, etc. Number new research projects initiated & completed.	- Farm Bill Programs: Biomass & Biofuel, Rural Developemt; State Legislature funds	Hawai'i Conservation Alliance, Pacific Islands Climate Change Cooperative, USFWS, The Nature Conservancy, CWRM, University of Hawai'i School of Ocean & Earth Sciences, USGS, NWHI	Farm Bill: Biomass & Biofuel Programs; S&PF Rural Development Program, Ecosystem Services Program, Forest Stew	State-Wide	2. Develop and implement strategic research plan based on existing research and symposia findings regarding Forest Product Industry
Priority Landscape that Contribute Area(s) Rural Development, Forest Stewardship Conservancy, Stewardship Conservancy, Program Areas Landscape that Contribute Area(s) Rural Development, Forest Stewardship Conservation Allicance, SPREP, Stewardship Conservancy, Stewardship Conservancy, Rural Development, Forest Products Industry (HFIA), Hawaii Conservation Allicance, SPREP, Stewardship Conservancy, Stewardship Conservancy, Resources Available/required Increase State and Private land acreage under commercial forestry management Programs: Biofinelm Bill Programs: Biofinelm Bill Programs: Government agencies execute additional leases, licenses or other agreements to private sector for public commercial timberlands							
	Supports National Objective	Measure of Success Increase State and Private land acreage under commercial forestry management Government agencies execute additional leases, licenses or other agreements to private sector for public commercial timberlands	Resources Available/required - Farm Bill Programs: Biomass & Biofuelm	Key Stakeholders Hawaii Forest Products Industry (HFIA), Western Forestry Leadership Coalition, Hawaii Conservation Allicance, SPREP, SPC, Forest Service, The Nature Conservancy,	Program Areas that Contribute Rural Development, Forest Stewardship	Priority Landscape Area(s)	Long Term Strategy 1. Foster the Development of an Integrated Forest Products Industry in Hawaii

•	

Hawaii Forest Product Strategies

	Program, SPREP, SPC			
	US Coast Guard, All Pacific Sea Grant			potential.
	Council, US Army Corps of Engineers,			market development
	Marine & Coastal Zone Advocacy			with the science and
	HDOA, The Nature Conservancy, DOH,			study is needed to assist
	USFWS, NPS, DOT, Office of Planning,			will work in Hawaii, a
	OHA, DOD, Hawai'i Tourism Authority,			Hawaii? Assuming they
	Hawai'i Conservation Alliance, NOAA,		State-Wide	4. Are Carbon Market for
purposes				
engineering & County permitting		-		
timber species or products for structural				
support certification of key Hawaii				
Complete wood properties testing to				
forest products	Conservancy, DOH, SPREP, SPC	Siewardsnip,		
Secure access at key ports for export of				o d
plantations	Office of Planning, HDOA, The Nature	Forest		doing Business in Hawaii
commercial forestry	Tourism Authority, USFWS, NPS, DOT,	Partnerships,		for Forest Product Entities
Land tax structure favoring	Hawai'i Conservation Alliance, Hawai'i	Watershed	State-wide	3. Improve Opportunities State-wide

	ii?	

Issue 9: Multi-State and Regional Issues

Hawaii's impact on Multi-State and Regional issues

Tropical forests serve many unique and essential life-supporting roles for the world at large. These important ecosystems are heavily impacted by deforestation, urban growth and expansion, increased carbon emissions, and threats to tropical biodiversity. Hawaii one of the most remote island groups in the world and have developed a myriad of ecosystems with high rates of endemism among the plant, animal and invertebrate inhabitants (Holdridge 1947). It has also afforded opportunities for many different human cultures to coexist. These islands are highly developed; offering a wealth of products, technologies, and world class marine and terrestrial experiences that stimulate tourism, competitive sporting events, unique research and exciting business opportunities. They offer important opportunities for air and sea travelers, local and tourist recreation, as well as an important U.S. Military presence in the Pacfic.

	seed protection and propagation with forest plants and food crops. Using methodologies that can be duplicated.		Resource Management, NOAA NWS, DOD, CWRM, University of Hawai'i School of Ocean & Earth Sciences, USGS, NWHI	Stewardship Program, Forest Legacy Program, schools, volunteer		Identify data gaps and/or issues found in other matrices that would be enriched by	A 7 =
	test new crop species under new climate conditions. Shift agriculture to suitable new lands. Initiate more trainings and expanded.	NOAA, Coastal Zone Mgmt Program, Forest Service Competitive grants	Cooperative), USFWS, NPS, USDA, HDOA, DOT, The Nature Conservancy, NOAA Office of Ocean & Coastal	Community Forestry, Conservation Education, Forest		loss or genetic diversity or food plants, native species and culturally important species.	(0 (t) => =
1.1 2.2 3.7	 Increased food security More studies that define monitoring of Hawaiian biodiversity 	US FWS, Dept. of Ag across Pacific, Local and Fed. EPA, Dept. of Transportation.	Hawaii Conservation Alliance, Department of interior (Pacific	FWS Section 7 grants,	Pacific-Wide	2) Work collaboratively to mitigate potential impacts of	- a N
Supports National Objective	Measure of Success	Resources Available/ Required to implement	Key Stakeholders	Program Areas that Contribute	Priority Landscape Area(s)	Long Term Strategy	
		ants	MultiState and Regional Issue: Protection of Genetic Diversity and Important Food Plants	on of Genetic Div	Issue: Protecti	MultiState and Regiona	
	visitors to Pacific Islands Reduce transportation and relocation of highly invasive species	Heads of Forestry across Pacific, NOAA and National Weather Service, NRCS, Forest Service Competitive grants	NOAA, NRCS, Forest Service, NOAA, NRCS, Forest Service, DOT, The Nature Conservancy, US Airline Companies, APHIS, Homeland Security, RISC, DOD	Conservation Education, EQIP, CIG,		programs to stop transport or insects & diseases, and export/import of species rated highly invasive across the Pacific.	# 2 0 5 7
3.6	More awareness of invasive species issues by travelers that visit Pacific Islands and countries More stringent screening for incoming	Hawaii, University of Guam, Australian Universities, New Zealand Universities, Community Colleges and	US Dept. or Ag. in all US require islands, Hawaii Conservation Allicance, US Pacific Island Committee, SPREP, SPC, New Zealand DOC Australia NPS	Protection & Monitoring, Urban & Community	Pacific-Wide: US & International	Develop and implement a Collaborative improvement Strategy (CIS) to raise awareness and implement	n (2 n -
Supports National Objective	Measure of Success	Resources Available/ Required to implement	Key Stakeholders	Program Areas that Contribute	Priority Landscape Area(s)	Priority Program Areas Long Term Strategy Landscape that Contribute Area(s)	

B			